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**Yang et al.**

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(54) **METHOD FOR ISOLATING  
 CROSS-REACTIVE APTAMER AND USE  
 THEREOF**

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 patent is extended or adjusted under 35  
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This patent is subject to a terminal dis-  
 claimer.

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(51) **Int. Cl.**

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(58) **Field of Classification Search**

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**15/115**; **C12N 2310/16**

See application file for complete search history.

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(57) **ABSTRACT**

The subject invention provides a SELEX strategy for iso-  
 lating cross-reactive aptamers that recognize a core structure  
 of a small-molecule family and bind to each several struc-  
 turally-similar molecules in the family. The subject inven-  
 tion also provides methods, assays, and products for detect-  
 ing small-molecule targets of the family in a sample in both  
 clinical and field settings. Such method is based on an  
 aptamer sensor that reports the presence of small-molecule  
 targets via a sensitive colorimetric signal for naked-eye  
 detection. The subject invention further provides exonu-  
 clease-based methods for generating structure-switching  
 aptamers from fully folded aptamers and developing elec-  
 trochemical aptamer-based (E-AB) sensors for rapid and  
 sensitive detection of synthetic cathinones.

**14 Claims, 16 Drawing Sheets**  
**(14 of 16 Drawing Sheet(s) Filed in Color)**  
**Specification includes a Sequence Listing.**